

REMARKS

Claims 59-68 are pending. Reconsideration and allowance are respectfully requested in light of the following remarks.

Response to Non-compliant Amendment

Claim 59 has been amended. Claim 59 is drawn to an iodine injection system. There is no recitation of a “laser,” and there is no other “system.” With this amendment, all claims are believed to be within Restriction Requirement. Applicant has made every effort to amend the claims to put them into condition for allowance over the prior art of record and implores the Examiner to contact the undersigned to reach an amicable conclusion.

Rejection under 35 U.S.C. §112

Claims 1-11, 13-16, and 18-28 were rejected under 35 U.S.C. §112, second paragraph. The following arguments are directed toward now pending Claims 57-68, as appropriate.

With respect to the term “laser cavity” in Claim 1, Applicant has cancelled Claim 1. Additionally, Claim 59 positively recites a laser. Therefore, this rejection is moot.

With respect to the term “iodine injection strut” in (which has been rephrased in Claim 59), the “iodine injection strut” clearly is a strut for injecting iodine. Therefore, Applicant has made it clear that the “iodine injection strut” is a strut for injecting iodine.

With respect to the recitation of a “Minimum Length Nozzle” or “MLN” (the abbreviation thereof), Applicant respectfully points the Examiner’s attention to page 5, line 4, to page 6, line 11 of the originally filed Application. Applicant has reproduced the relevant section below for the Examiner’s convenience:

The benefits of the preferred SOG are compromised by using it with current nozzle and iodine injection technology. A new nozzle approach; namely, a minimum length nozzle is required. By definition, a MLN is an inviscid flow design approach for a divergent nozzle whose length between the throat and the exit plane is a minimum and where the flow in the exit plane is uniform and supersonic. This type of nozzle can be two-dimensional or axisymmetric. Here, only the two-dimensional version is of interest. There are two sub-types; a nozzle with a straight sonic line or with a curved sonic line, where the curved line is a circular arc.

All MLN versions have a wall contour with a sharp corner at the throat. For the same specific heat ratio, throat dimension, and nozzle exit Mach number, MLNs are substantially shorter and possess a much larger favorable pressure gradient, just downstream of the throat, than a comparable conventional nozzle.

The length of a two-dimensional MLN with a straight sonic line is known to be shorter than a curved sonic line MLN. The difference, however, is rather small. Moreover, the curved sonic line version has several advantages over its straight sonic line counterpart. As is known, the sonic line in a conventional nozzle is roughly parabolic. The curved sonic line approximation is thus a more realistic approach than that of a straight sonic line. As discussed in T.L. Ho and G. Emanuel, "Design of a Nozzle Contraction for Uniform Sonic Throat Flow," AIAA J. 38, 720-723 (2000), it is quite difficult to design a converging nozzle section that ends with a straight sonic line. A lengthy nozzle section, upstream of the sonic line, is required. The short converging nozzle section, used here, is more compatible with a curved sonic line. Another factor is that a two-dimensional curved sonic line MLN possesses an exact analytical solution; it is the only MLN configuration where this is the case. Full advantage is taken of this feature in the subsequent presentation.

Clearly, from the above reproduced section, "minimum length nozzle" is a term of art and not a broad recitation of length. Additionally, even if the Examiner does not accept that a "minimum length nozzle" is a term of art, according to MPEP §2111.01(III), an applicant is entitled to be his/her own lexicographer. Therefore, the Examiner should interpret an MLN to be "an inviscid flow design approach for a divergent nozzle whose length between the throat and the exit plane is a minimum and where the flow in the exit plane is uniform and supersonic," indicating a mathematical relationship between the exit gas characteristics and the length of the nozzle. Therefore, Claim 59 complies with 35 U.S.C. §112, second paragraph.

With respect to "the description is not intended to limit the scope of the inventions as defined by the claims," this phrase is commonplace within patents. This phrase is intended so that

limitation will not be read in from the specification into the claims, nothing more. However, for the sake of comity, Applicant has deleted this phrase.

Rejections under 35 U.S.C. §102 and §103

Claims 1-4, 6, 8, 18, 20, and 27 stand rejected under 35 U.S.C. §102(b) in view of U.S. Patent No. 2,625,008 by Crook ("Crook"). Claims 1, 2, 6, 8, 10, 18, 20, 21, 26, and 27 stand rejected under 35 U.S.C. §102(e) in view of U.S. Patent No. 6,315,221 by Goenka et al. ("Goenka"). Claims 1, 2, 6, 8, 10, 11, 12, 20, and 21 stand rejected under 35 U.S.C. §102(b) in view of U.S. Patent No. 2,613,999 by Sher et al. ("Sher"). Claims 1, 2, 6, 8, 27, and 28 stand rejected under 35 U.S.C. §102(b) in view of U.S. Patent No. 1,608,998 by Riiho ("Riiho"). Claims 1, 2, 6, 8, 10, 14, 18, 20, and 23 stand rejected under 35 U.S.C. §102(b) in view of U.S. Patent No. 6,072,820 by Dickerson ("Dickerson"). Claims 1, 2, 6, 8, 10, 11, 18, 20, and 28 stand rejected under 35 U.S.C. §102(b) in view of U.S. Patent No. 5,023,883 by Jacobs et al. ("Jacobs"). Claims 7, 9, 15-16, 19, and 22 stand rejected under 35 U.S.C. §103(a) in view of Goenka. Claims 5 and 23-25 stand rejected under 35 U.S.C. §103(a) in view of Sher. The following arguments are directed toward now pending Claims 57-68, as appropriate.

Neither Crook, Goenka, Sher, nor Riiho teach, disclose, or suggest an iodine injection system as claimed. Crook discloses a variable C-D nozzle for use in a propulsive thrust engine (i.e. turbojet or turbofan), and not an MLN. Goenka discloses a nozzle having exit ports for material such as paint, and not an MLN. Sher discloses an atomizing nozzle which evenly disperses fluid into a flow, and not an MLN. Riiho discloses a fog machine that uses a nozzle, but does not show an MLN. None of these references, singularly or in combination, disclose the use of an MLN, let alone an MLN for use with a laser that includes an iodine injection strut.

With respect to Dickerson, Dickerson does disclose a COIL. However, the Examiner states that reference numeral 10 of Dickerson is “a symmetric two dimensional minimum length nozzle.” As Applicant stated above, an MLN is a term of art, where specifically, the “flow in the exit plane is uniform and supersonic.” Dickerson’s only use of the word “uniform” is at column 3, line 25, which describes that the distribution of chlorine is uniform, not the flow. Therefore, Dickerson clearly does not show an MLN for use with a laser that includes an iodine injection strut.

With respect to Jacobs, Jacobs discloses a combustion chamber (4) and a laser cavity (10). Interposed between the combustion chamber (4) and laser cavity (10) are a number of nozzle blades (5), which (according to the Examiner) have an outer surface that form an MLN with the inner surface of the cavity (4). If this is correct, the nozzle blades (5) are not struts and are not located downstream of the throat, but instead form the throat. Clearly, the nozzle blades (5) cannot form the throat and form a strut that is located downstream of the throat. When compared to the claimed inventions, which states that “at least one iodine injection strut...is located downstream of the throat,” Jacobs does not and cannot disclose all of the elements of the claimed inventions.

Restriction Requirement and Drawings

Applicant has cancelled Claims 1-58, and the drawings **have been amended**.

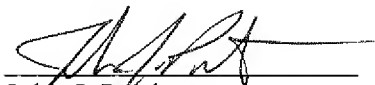
Conclusion

Applicant does not believe that any fees are due; however, in the event that any fees are due, the Commissioner is hereby authorized to charge any required fees due (other than issue fees), and to credit any overpayment made, in connection with the filing of this paper, to Deposit Account 50-2180 of Storm LLP.

Should the Examiner require any further clarification to place this Application in condition for allowance, the Examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted,

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